GEOGRAPHIC NEWS BULLETINS

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(The National Geographic Society is a scientific and educational Society, wholly altruistic, incorporated under the Federal law as a non-commercial institution for the increase of geographic knowledge and its popular diffusion.)

General Headquarters, Washington, D. C.

Contents for Week of November 25, 1935. Vol. XIV. No. 20.

1. Byrd Antarctic Expedition Conquered Climate, Captured Facts
2. Antarctic Whale-Pastures Where the Plankton Grows
3. Dunfermline Gave the World the "Star-Spangled Scotchman"
4. Football Vies with Turkey on Thanksgiving
5. California 85 Years a State

© *New York Times and St. Louis Post Dispatch*

STOKING THE RESERVOIR IN LITTLE AMERICA

The Antarctic furnished only one comfort—water—and that, reluctantly. Members of the Second Byrd Antarctic Expedition had to fetch their pails of water not with buckets but with shovels. They took turns shoveling snow into a pipe leading to the mess-room stove, where a melter converted it into water. One bucketful of snow melted to one-third of a bucketful of water in about a half-hour. And developing one roll of aërial film required 200 gallons! (See Bulletin No. 1).

HOW TEACHERS MAY OBTAIN THE BULLETINS

The Geographic News Bulletins are published weekly throughout the school year (thirty issues) and will be mailed to teachers for one year upon receipt of 25 cents (in stamps or money order). Entered as second-class matter, January 27, 1933, at the Post Office at Washington, D. C., under the Act of March 8, 1879. Acceptance for mailing at special rate of postage provided for in section 1103, Act of October 3, 1917, authorized February 9, 1922.

GEOGRAPHIC NEWS BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Byrd Antarctic Expedition Conquered Climate, Captured Facts

RECENT publications by Admiral Byrd are rounding out contributions from what was perhaps the most ambitious and successful scientific expedition into a hostile, uninhabited land in the history of man's search for knowledge—the Second Byrd Antarctic Expedition. Already scientists are working on helpful new technical data which the expedition brought back. And now the general reading public, as rocking-chair adventurers, can enjoy the excitement of exploring this new realm through the printed page.

A Modern Columbus Remakes the Map

After nearly two years on a fact-hunt, which was frequently a fight for life of man and science against nature in an unfriendly mood, the expedition's fifty-six pioneers returned last spring with a game bag full of startling new facts and theories. As official spokesman, Admiral Byrd summarized results in a speech before members of the National Geographic Society.

"The Antarctic, as you know, has an ice age going on, which is in its full tide, such an ice age as existed at the top of the world 30,000 years ago. The ice sheet down there varies probably from about two miles thick to a few feet. Therefore we think that hundreds of years ago the ice that covered many states of this country probably was as much as two miles thick.

"As to geography, we have discovered and taken possession of for the United States a land area as large as the combined Atlantic Seaboard States from Maine to Georgia. . . .

"There are other interesting changes in the map. For example, the National Geographic Society's Map of Antarctica shows a great white unknown blank space about 150,000 miles in area north of the 75th parallel of latitude and between longitude 120 and 60 west. By ship and airplane we wiped that area off the map and put it into the column of the known by proving it to be a part of the great Pacific Ocean. . . .

Antarctica Is Just One Continent Instead of Twins

"We were fortunate enough to settle the much-talked-of geographical question as to whether there were two continents or one at the bottom of the world, and by aviation it was proved that there is only one. A great controversial question as to whether or not there existed a passage between Ross and Weddell Seas was thus settled."

These are only a few of the discoveries which affect geography. The Expedition also added to the sum of man's knowledge by gathering facts about astronomy and cosmic rays, plant and animal life, bacteria, fossils, weather, ocean conditions, rock formations, magnetism, and glaciers.

While the average reader, as a matter of curiosity, may come to know something of the new map of Antarctica, he will hardly find a personal need to study it, as if with the idea of spending a vacation down where the midsummer temperature "soars" to five degrees above zero. But everyone is interested in the problem of keeping alive under unfavorable conditions, and that is the main topic of most stories of the expedition's adventures.

These accounts tell of unusual ways in which living creatures fit themselves into icy surroundings where life would seem impossible. Members of the expedi-

UMI

© N. Y. T. & St. L. P. D.

WHALES ARE EASILY CAUGHT IN LITTLE AMERICA—BY THE PHOTOGRAPHER

One whale is indicated by the little cloud of steam in the foreground, made when his warm breath, exhaled at regular intervals of a number of minutes, is condensed in the cold air. The other one, perfectly apparent, is keeping part of his head above water to look for a clear channel between pieces of floating ice. Whalebone whales can eat only plankton, which has lured them so close to shore (See Bulletin No. 2).

GEOGRAPHIC NEWS BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Antarctic Whale-Pastures Where the Plankton Grows

NEAR the beginning of this century, after the number of whales in northern waters had been seriously reduced by unrestricted killing, fishermen began to realize that "Thar she blows!" was a more familiar cry among the icebergs of the southern seas than anywhere else in the world. Investigations soon showed them that the whales' reason for choosing those waters was the same as a man's reason for choosing his restaurants—"They serve better food there, and more of it."

The Diet of Toothless Whales

Although the killer whale is provided with about two dozen pairs of dangerous teeth on his lower jaw, whalebone whales have no teeth at all. Instead, they have long thin bonelike strips, called baleen, set close together in the upper jaw and hanging down across their mouths, each strip frayed out on the inner edge into a fuzzy netlike mass of fibers. "How," fishermen had often wondered, "can they bite or chew?" The answer is that they can't; therefore they must pass up the juicy squids and cuttlefish on the whale-menu for their toothy relatives, and satisfy their appetites by swallowing whole the minute defenseless creatures of plankton. And since their favorite plankton is to be found near the floating ice masses of the Antarctic, whalebone whales swim down there for a mile or two of dinner.

Plankton is a floating collection of tiny plants and animals and infants of some larger sea creatures, drifting with currents near the surface of the water. The microscopic inhabitants of the plankton community are so very small that for a long time they were recognized only as a strange color tinging the sea—"a band of orange-colored water extending for many miles," "two patches of reddish-colored water." Their presence gave the Red Sea its name. Other forms of plankton make the surface of the ocean shine with phosphorescence at night. These luminous creatures mysteriously produce what the world's wisest scientists cannot copy, "cold light," the perfectly efficient light that loses no part of its energy in heat.

When finally recognized as living and not lifeless dust, the sea's drifting menagerie was named plankton, or floating life.

Microscope Discloses Fairy Beauty

Specimens under a microscope revealed that the tiny animals and plants looked like fairy jewels of fantastic shape—snowflakes with glittering shells of glass, globules round as pearls but with the brilliance of diamonds, miniature crabs and shrimps almost transparent with only the faintest pink tint, small shining lozenges like cough-drops with feathery fins, sea butterflies with filmy wings. Labeling them with such lengthy names as *chaetoceros neglectus* and *thalassiosira antarctica* —to cover which hundreds of the little creatures would have to be placed end to end—scientists have been studying them because of their great importance to fishermen.

Many fish depend upon plankton for food, and fishermen have noticed that a season of superior fish can be attributed to a big plankton crop. Scarcity of plankton has prevented small fish fry from living to maturity. There are rare instances of plankton causing chemical conditions in the water from which whole areas of oysters and fish have been poisoned. Ordinarily, however, the little units of plankton are as useful as they are numerous, and their true number is so high that it can only be guessed. One square mile of salt water has been known to yield 16 tons

UMI

tion found tiny primitive mosses, with separate plants about the size of a pinhead, growing on one of the world's southernmost mountainsides, where only a couple of weeks' warmth each year could thaw them out. Seals, having decided against going north for the winter, were found patiently gnawing holes in the ice as it froze over them, working constantly to get the air without which they could not live under water.

But most remarkable of all was the way in which the fifty-six men of the expedition protected themselves against merciless sub-zero temperatures, for 110 degrees below freezing was only "cooler to-day." In addition to discovering new land in the Antarctic, Admiral Byrd manufactured a new climate for a tiny part of it. Tricking the marble-hard snow into being a shelter as well as a menace, the citizens of Little America built a community for which they had to import all the materials except water. Three airplanes, four tractors, an autogiro, $100,000 worth of scientific equipment, 126 dogs, 3 cows, furs to be tailored into clothing and mittens, even wood for housing—all these and nearly 14,000 other items, from telephone poles to a rubber nipple for a puppy's nursing bottle, were carried thousands of miles to construct and equip their little town in the snow. Here the expedition brought the twentieth century to the ice age.

Note: Excellent project material about the First and Second Byrd Antarctic Expeditions can be found in the following: "Exploring the Ice Age in Antarctica," *National Geographic Magazine*, October, 1935; "Mapping the Antarctic from the Air," October, 1932; and "Conquest of Antarctica by Air," August, 1930.

See also in the GEOGRAPHIC NEWS BULLETINS: "Byrd Expedition Homeward Bound," week of March 11, 1935; "Sea, Stratosphere, and Polar Ice Featured in 1934 Explorations," week of January 14, 1935; "The Penguin, F. F. A. (First Family Antarctica)," week of January 22, 1934; "Following New Conquests of Antarctica," week of January 8, 1934; and "Admiral Byrd Takes Dogs as well as Planes to Antarctica," week of October 16, 1933.

Consult also the map of the Antarctic Regions published as a free supplement to the October, 1932, *National Geographic Magazine*. Additional copies can also be had postpaid at 50 cents (paper) and 75 cents (linen). The revised map, showing the most recent discoveries, was published in the *National Geographic Magazine*, October, 1935, pp. 450-451.

Photograph courtesy Paramount Publix Corp.

HOW TO BE HUSKIES: LESSON NO. 1

Only a few days old, these puppies are getting their first sniff of their native climate and their first experience with a tiny harness. Some day they will know how to lunge forward when the driver shouts "Yake!", which is dog-language for "go." Their feltlike coat protects them amply from the cold.

GEOGRAPHIC NEWS BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Dunfermline Gave the World the "Star-Spangled Scotchman"

ON NOVEMBER 25, the "auld gray toun" of Dunfermline, Scotland, will celebrate the centennial of the birth there of Andrew Carnegie.

On that day, the common sight of thousands of children trooping out of Carnegie public libraries with arms full of books will be an additional memorial to the man who made reading the privilege of the poor, as well as the prerogative of the wealthy. Millions of readers in the 1,946 libraries he had established in the United States before 1919 and the 865 for English-speaking people in other parts of the world will turn grateful eyes toward his birthplace.

City of Philanthropy and Royalty

Dunfermline, a city of about 37,000 population, stands on the brow of a hill 16 miles northwest of Edinburgh. From it one may see the massive outlines of Edinburgh Castle and the winding Firth of Forth, three miles away, which flows into the North Sea.

Dunfermline is one of Scotland's greatest national shrines, having been for centuries a favorite residence of Scottish kings. The old ballad, "Sir Patrick Spens," refers to it as a royal residence.

Dunfermline Abbey, sometimes called "the Westminster of Scotland," contains many tombs of royalty. Between 1093 and 1603, eight kings, six queens, five princes, and two princesses were buried in it. Beneath the Abbey's pulpit lie the remains of Robert Bruce. In 1818, when investigators opened his tomb and parted the gold-threaded shroud, they discovered his ribs had been severed, perhaps to carry out his request that his heart be carried on a crusade. Near the Abbey are the remaining walls of what was the royal palace rebuilt by Robert Bruce. Charles II and Queen Mary are said to have resided there. Dunfermline was also the seat of Malcolm Canmore, the first king of a united Scottish nation, and the original for Malcolm in "Macbeth."

Carnegie Charity Begins at Home Town

Below the Abbey is lovely wooded Pittencrieff Glen, a public park where children are encouraged to make pets of squirrels and unusually tame birds. Andrew Carnegie deeded the Glen to the citizens of Dunfermline in 1903. A Scotchman is quoted as explaining the reason for this donation: "Ye see, when the late Mr. Carnegie was a wee lad, he wasna pairmitted to enter the park. It was a private property. And he never forgot it! When the time came he gave it to Dunfermline so that no wee child should ever feel locked oot of it as he was."

This same desire to give underprivileged children all the benefits which he lacked prompted Mr. Carnegie to bestow on his native town free baths (his first public gift), colleges of hygiene, a gymnasium, and in 1881 a handsome public library, the first of almost 3,000 now scattered throughout the United States and Great Britain.

Located near the great coal mines of West Fifeshire and the Rosyth Naval Base, which formerly docked and repaired many warships, Dunfermline is an important commercial center. A major industry is the manufacture, bleaching, and dyeing of fabrics, both linen and silk. Before the widespread use of machine looms, the city's damask table linen, woven on hand looms, achieved wide renown.

Andrew Carnegie's father was a hand loom worker, one of many thrown out

UMI

of minute skeletons, but of the millions without skeletons there is little chance of an accurate estimate. One little skeleton might be as small as the period of a sentence, but there would be still an animal small enough to creep inside that empty shell and have plenty of room in his secondhand home. Drifting to the sea floor and decomposing, these skeletons furnish a fresh supply of life-giving chemicals for the other inhabitants of the ocean.

Plankton cannot swim, but must float with the ocean currents. To prevent sinking to cold dark depths, where it could not live without light, it is equipped with many different kinds of water wings. Naturally it is thickest around coasts and where ocean currents meet.

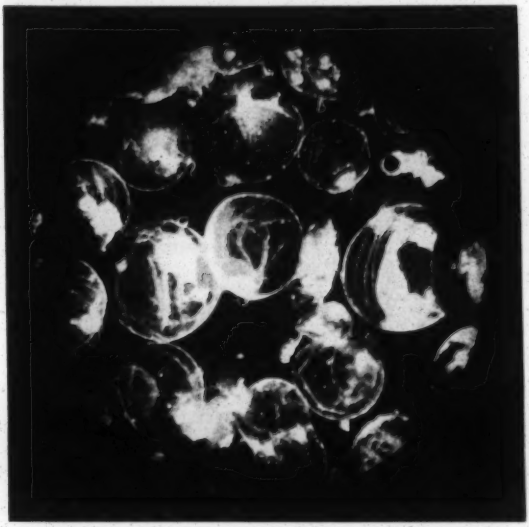
Of the Antarctic plankton, the most usual plant is the diatom, a microscopic creature of a single cell within two halves of a delicate glassy shell that fit together like halves of a pillbox. By far the most common animals are the little shrimplike creatures which scientists call *euphausia superba* Dana. Norwegian fishermen have dubbed them "krill" for short. Seldom more than an inch long, krill nevertheless spends nearly two years growing up. Krill eyes, dark and prominent on stalks, have a rim of microscopic lanterns, each equipped with lens, reflector, and light-producing tissue, and it is believed that they actually serve as headlights for navigating dark waters. Phosphorescence is also produced in other spots on krill.

Scientists obtain specimens to study by towing a fine silk net along on the surface of the water for a "horizontal catch" or sinking a self-closing bottle down for a "vertical catch." Another source of information is the stomach of a whale that has just been caught. It is estimated that a large whale must consume cartloads of krill for one square meal, and the stomach of a whale taken where whale food plankton is plentiful may be stretched by its contents nearly to the bursting point.

The mysterious whale-routes across the open sea may be marked out by currents bearing stray communities of krill. It has been suggested that boundaries of an Antarctic continent of long ago, now beneath the sea, may be "remembered" among schools of whales as the location of krill, and the unexplained whale-paths may trace coasts that have disappeared centuries ago.

Note: See also "Living Jewels of the Sea (Plankton)," *National Geographic Magazine*, September, 1927, illustrated in color; "Fishes of Our North Atlantic Seaboard," December, 1923; and "South Georgia, An Outpost of the Antarctic," April, 1922.

Bulletin No. 2, November 25, 1935.



THEY "SET THE SEA AFIRE"

A drifting plankton community carries its own lighting system, which causes the so-called "burning of the sea" described by awed sailors. A jar full of water containing many of the one-celled *Noctiluca* (here magnified 50 times) has served as a primitive light bulb for reading newspaper print. *Noctiluca* has no special organ to produce its light, but glows from many tiny granules distributed through its body.

Photograph by William Crowder

GEOGRAPHIC NEWS BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

Football Vies with Turkey on Thanksgiving

FOOTBALL games have become in recent times a definite part of Thanksgiving holiday celebration. One prominent collegiate football association lists 120 Thanksgiving games among its own member teams. No less than 800 colleges have teams organized under coaches, and high school elevens are numbered by thousands. Many of them are planning for the season's biggest game on Thanksgiving, with grandstands and sidelines crowded with possibly twenty to thirty million spectators.

There are three standard types of football game: Association football, frequently called soccer, in which the ball may not be touched except with the feet; English Rugby, in which handling the ball figures in as many plays as kicking it; and American Rugby, in which the game has become so scientific that each player's work is highly specialized.

Ball Carried, Instead of Kicked, First at Rugby

Rugby takes its name from the boys' school in Warwickshire, where a stone in the school wall commemorates the deed of a student who, in 1823, "first took the ball in his arms and ran with it, thus originating the distinctive feature of the Rugby game."

Missionaries and business representatives have carried the game around the globe. To New Zealand, Australia, South Africa, and America colonists took memories of football and soon translated them into action. Nearly half a century ago an English mining company introduced the pigskin to the Province of Huelva in Spain, and now Seville watches football as well as bullfights. In Chile and Peru football fever has attacked the educated classes who have come under North American influence.

Teams are told to fight 'em in Japanese now, since football has become a part of Japan's military training, through which more than 100,000 young men pass annually. Tokio alone has two huge grandstands, one seating 30,000 spectators and the other 80,000.

The president of a college in Beyrouth (Beirut) stated that he encouraged the game, because "you will find the son of a prince playing football under the captaincy of a peasant or the son of a cook. . . . The game develops the ability to receive a hard blow without showing the white feather or drawing a dagger."

Mountain Football on Horseback and Yak-back

In some schools of Kashmir, pupils are graded on athletics, and they receive four times as much credit for football as for mathematics to encourage them in physical exercise. There is no need, however, for encouraging a wild Himalayan sport, half football and half polo. "Bous-Kasshia," as they call it on the roof of the world, is played by men mounted on half-wild horses or low shaggy yaks with ferocious horns. The "ball" is the body of a sheep whose head and lower leg joints have been cut off. There is an umpire, but his duty is to start the fracas, not to stop it; he tosses the sheep in front of the riders by way of a kick-off. Instantly lightning action begins. Every man makes a grab for the sheep, tugging at its wool until someone jerks the "ball" from the clutches of all the others and tries to gallop out of their reach. Then the whole group thunders after him, trying to snatch away the cumbersome sheep. The surest way to "carry the ball" is for the rider to tuck it under his knee, holding it with his leg against the saddle. There are no rules of the game except the law of self-preservation, and a man disregards that at his own peril.

Football, while not as old as the hills which look down upon the games in the Himalayas, in various forms has thrilled athletes and fans in many ages. Ancient Greeks included it in their famous sports program, calling it Harpaston, meaning "forward pass." They passed the ball to conquerors from Rome, where rules were changed to make the game rough enough for "warming up" fighters as part of their military training. The game was still scoring in medieval Italy, when players wore hide shoes to strengthen their kick.

Meanwhile England had had its first down when invading Roman legions, in the first century or two A.D., had laid out primitive football fields near their camps. Scholars claim that Ireland knew the game even before that, and it is true that the sport became so popular there that Shrove Tuesday was annually the occasion for a free-for-all scrimmage in which nearly the entire community, both men and women, would play a game so crowded that the ball was hard to find.

Similar boisterous games played in village streets in England won football the reputation of being "meeter for lameing than making able the users thereof." Henry VIII and Queen Elizabeth banned it. Schools continued its use as a phase of physical training.

UMI

of work by the advent of the factory system. When his wife tried to make ends meet by mending shoes, the young boy Andrew helped her by threading the needles.

The humble cottage at Number 4 Moodie Street, where they struggled against poverty, is now a museum filled with scrolls from many towns thanking the so-called "Star-Spangled Scotchman" for his libraries, pipe-organs, and other munificent gifts.

Carnegie's benefactions expressed his love of reading, art, music, and of peace. To further the last, he built the Peace Palace at The Hague. In all, he gave $350,000,000 for public purposes, claiming that "the man who dies possessed of wealth which he was free to distribute, dies disgraced." The Carnegie Hero Fund Commission, the Carnegie Foundation for the Advancement of Teaching, the Carnegie Endowment for International Peace, and three other institutions for the advancement of science and the fine arts are additional memorials in the United States to his generosity.

Note: Teachers planning programs to celebrate the Carnegie Centennial will find additional material about Scotch life in the following: "Vagabonding in England," *National Geographic Magazine*, March, 1934; "Edinburgh, Athens of the North," August, 1932; and "Prehistoric Telephone Days," March, 1922.

Bulletin No. 3, November 25, 1935.

Photograph by Capt. Alfred G. Buckham

FLOWING AROUND AND DOWN TOWARD DUNFERMLINE

The River Forth twists itself into "links," as the Scottish people say, for 66 miles of river through 30 miles of land. Then it becomes the Firth of Forth, which offers a beautiful view from the heights of Dunfermline.

GEOGRAPHIC NEWS BULLETIN

Published Weekly by

THE NATIONAL GEOGRAPHIC SOCIETY

(Founded in 1888 for the Increase and Diffusion of Geographic Knowledge)

General Headquarters, Washington, D. C.

California 85 Years a State

CALIFORNIA celebrated the 85th year of its attainment of statehood recently with Admission Day, a State holiday. The occasion recalls one of the most colorful periods in the history of the United States.

When admitted to the Union in 1850, California was a sort of outlying "island" in the midst of vast territories which in some cases were not organized into states until as much as sixty years later.

In fact, California was actually believed to be an island in early Spanish times. Though its coast was touched in 1542-43 by Spanish navigators, California was not settled until 1769. Spain then added it to her Mexican territory to forestall occupation by England or Russia.

Gold Gained California Admission

Distance and sparseness of settlement kept California from ever developing close ties either to Spain or to Mexico. Many Americans went to California to settle, and there was strong sentiment for annexing California to the United States both among these immigrants and among Americans at home, where the doctrine of the "manifest destiny" of American westward expansion was taking hold.

Gold and the Mexican War made California a part of the United States. Not long after the declaration of war on Mexico, American forces in California hoisted the United States flag, and the area was formally ceded to this country on February 2, 1848, under the treaty of peace.

Only a few days before, James W. Marshall had made his famous discovery of gold at Sutter's mill on the American River near Coloma. In a few weeks the California gold rush was on. By the end of 1849 it is estimated that 80,000 men had flocked to California. San Francisco Bay contained at one time 500 ships deserted by sailors seeking gold. The large majority of them were Americans, and the territory became American in fact as well as in name. Meanwhile the slavery question was coming to the fore. The Union had a balance of fifteen slave States and 15 free. When California began preparing to seek Statehood, there were strong efforts to make it a slave State, but when its constitution was framed slavery was prohibited. It was admitted to the Union on September 9, 1850. There was for a while a plan to split California into two states, allowing slavery in the southern one.

A State of Many "Firsts"

California has made phenomenal progress since the days of '49, when red-shirted gold miners kept order by rough and ready methods and there were fewer people in the whole State than live to-day in the capital city, Sacramento. Only 8 per cent of the population consisted of women, with seldom more than 2 per cent in mining camps.

Oil and oranges now have an annual value greater than the gold that is dug each year from California mines. Recently, however, there has been a revival of interest in gold mining, and many of the unemployed have made a few dollars a day by primitive mining methods resembling those used by the "Forty-Niners."

Second in area among all the 48 States, California is first in many things. It has the highest mountain in the United States outside Alaska—Mt. Whitney—and the lowest point in the country—Death Valley. Its motion picture industry

UMI

Seventy years of change in America has made football almost a different game. The world's first intercollegiate football match, in which Rutgers defeated Princeton, was played on November 6, 1869. After a scoreless game with the Rugby team of Canada's McGill University in 1874, Harvard started the substitution of Rugby for Association rules, permitting carrying the ball. Then the old football game, with teams of 25 and 45-minute halves, began to demand more hand and less foot, acquiring names for the players' positions.

Players first wore tights, then one-piece suits of light leather, and first donned the present type of breeches about forty years ago, along with helmets. The ball was simply an inflated pig bladder centuries ago. In Elizabethan days it was stuffed with shavings, which a player once shook out so he could easily hide the ball on its way to the goal. Harvard was tricked in 1903 when an opponent hid the ball beneath the back of his jersey and ran to the goal. Indoor and night football are recent developments. Although there are only nine major league professional teams, football has huge gate receipts. One college is known to have earned more than a million dollars in one year. James IV could hardly call "fute-ball" an "unprofitabll sportis" today.

Note: Additional pictures and text references to football and allied games can be found in "Washington, The Evergreen State," *National Geographic Magazine*, February, 1933; "Ohio, The Gateway State," May, 1932; "Louisiana, Land of Perpetual Romance," April, 1930; "Oxford, Mother of Anglo-Saxon Learning," November, 1929; "Ireland, The Rock Whence I Was Hewn," March, 1927; "Outwitting the Water Demons of Kashmir," November, 1921; "Rio de Janeiro, in the Land of Lure," September, 1920; and "The Geography of Games," August, 1919.

Bulletin No. 4, November 25, 1935.

Photograph by Topical Press Agency

AN ABOUT-TO-BE-COMPLETED FORWARD PASS AT OXFORD

In England, where football is called "Rugby" or affectionately "Rugger," the game has more action and fewer tactics than in the United States. At Oxford a first-string man is called a "blue."

leads the world. It has the world's largest telescope, the 100-inch instrument at Mt. Wilson Observatory of the Carnegie Institution. Also, the new huge 200-inch telescope of the California Institute of Technology will be mounted on Mt. Palomar in the southern part of the State.

Los Angeles, with its suburbs, covers more territory than any other city in the United States, though it is fifth in population. Many of California's famous big trees, the sequoias, preserved through aid of members of the National Geographic Society, are older than the pyramids.

California leads all States in irrigation, which has turned vast areas of its arid land into rich fruit and vegetable farms. It produces all the borax used in the United States and most of the grapes.

Note: Additional photographs and data about California may be found in the following: "Southern California at Work," *National Geographic Magazine*, November, 1934; "Among the Big Trees of California," August, 1934; "California Trapdoor Spider Performs Engineering Marvels," August, 1933; "Men and Gold," April, 1933; "Out in San Francisco," April, 1932; "Befriending Nature's Children," February, 1932; "California, Our Lady of Flowers," June, 1929; "Seeing America from the 'Shenandoah'," January, 1925; "The Non-Stop Flight Across America," July, 1924; "Saving the Redwoods," June, 1920; "Our Big Trees Saved," January, 1917; and "The Wonderland of California," July, 1915.

A two-page map accompanies the first article, pp. 534-535.

Bulletin No. 5, November 25, 1935.

Photograph by McCurry from Keystone-Underwood

WHEN CALIFORNIA WAS ATTRACTIVE FOR HER GOLD AND NOT FOR BEAUTY

A daguerreotype eighty years old shows a gold-rush town hastily built by men too busy prospecting for gold to beautify the community. Originally called "Hangtown," perhaps because of the frontier justice method of dealing with lawbreakers, this town was incorporated in 1854 as Placerville. "Placer" mining consisted of the simple procedure of washing gold from sand and gravel.

UMI